Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ALGEBRA.

316. Proposed by B. F. FINKEL, Ph. D.

To prove that $\sum_{1}^{n}(-1)^{r-1}\frac{{}_rC_n}{r}=\sum_{1}^{n}\frac{1}{r}$.

II. Solution by S. LEFSEHETZ, East Pittsburg, Pa.

The proposition being true for $n=1$ and 2, the following is a proof by induction.

Suppose that $\sum_{1}^{n-1}(-1)^{r-1}\frac{1}{r}\cdot{}_rC_{n-1}=\sum_{1}^{n-1}\frac{1}{r}\ldots(1)$.

Since ${}_rC_{n-1}=\frac{n-r}{n}{}_rC_n$, therefore $\frac{1}{r}{}_rC_{r-1}=\frac{1}{r}{}_rC_n-\frac{1}{n}{}_1C_n$.

$$\therefore\sum_{1}^{n-1}(-1)^{r-1}\frac{1}{r}{}_rC_{n-1}=\sum_{1}^{n-1}(-1)^{r-1}\frac{1}{r}{}_rC_n-\frac{1}{n}\sum_{1}^{n-1}(-1)^{r-1}{}_rC_n=\sum_{1}^{n-1}\frac{1}{r}\ldots(2).$$

But $(1-1)^n=0=-\sum_{1}^{n-1}(-1)^{r-1}{}_rC_n-(-1)^{n-1}{}_nC_n+1.$

$$\therefore-\sum_{1}^{n-1}(-1)^{r-1}{}_rC_n=(-1)^{n-1}{}_nC_n-1.$$

By substituting in (2), we have, $\sum_{1}^{n}(-1)^{r-1}\frac{1}{r}{}_rC_n=\sum_{1}^{n}\frac{1}{r}$.

321. Proposed by C. C. BLAND, Attorney at Law, Rolla, Mo.

A corporation is capitalized for \$20,000. 125 shares of the par value of \$100 per share has been issued. A has 27 19/78 shares. B, C, D, E, and F each have 19 43/78 shares. It is the wish of the corporation to cancel the certificates held by A, B, C, D, E, and F, and to issue new certificates to each of them in lieu of those now held by them, and to avoid the issuance of any certificate for a fraction of a share. How many shares should each receive, the whole not to exceed 200, at the same time maintaining the present interest of each in the corporation?.

Solution by G. B. M. ZERR, A. M., Ph. D., Philadelphia, Pa.

The value of $27\frac{19}{78}$ shares $=\$2724\frac{14}{39}=\$\frac{106250}{39}$, and the value of $19\frac{43}{78}$ shares $=\$1955\frac{5}{39}=\$\frac{76250}{39}$.